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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/746,174	12/21/2000	Christopher S. MacLellan	EMC2-085PUS	2915

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EXAMINER	
BAKER, STEPHEN M	

ART UNIT	PAPER NUMBER
2133	

DATE MAILED: 04/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/746,174	MACLELLAN, CHRISTOPHER S.	
	Examiner	Art Unit	
	Stephen M. Baker	2133	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 November 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *6 and 7* is/are allowed.

6)☒ Claim(s) *1-5* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,559,506 to Leitch *et al* (hereafter "Leitch") in view of U.S. Patent No. 4,682,328 to Ramsay *et al* (hereafter "Ramsay") and the published article "A Tutorial on CRC Computations" written by Ramabadran *et al* (hereafter "Ramabadran").

Leitch discloses protecting transmitted data bits by generating single vertical parity and single horizontal parity for every row and column of the data while the data is arranged in an R × Q bit array, transmitting the bits of the (R+1)×(Q+1) 2-Dimensional parity block code in column order, interleaved between tiers of other 2-D parity block codes. Leitch further discloses validating/correcting the transmitted data upon reception by a process including checking the vertical and horizontal parities.

Leitch does not refer to the process of checking vertical and horizontal parity as one involving "comparing" received parity with re-generated parity. Ramsay provides an example of conventional parity checking, by comparing received parity with re-generated parity. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to implement Leitch's horizontal and vertical parity checking by comparing each received parity bit with a corresponding re-generated

parity bit, because performing parity checking by comparing a received parity bit with a re-generated parity bit is conventional, as evidenced by Ramsay.

Although Leitch does not specifically show an embodiment with R=8 or Q=8, Leitch teaches no limit on R and Q other than that they both are positive integers. Additionally, the term "byte" has been known to be applied to groups of 4 bits. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to choose R or Q = 8 (assuming a "byte" refers to 8 bits) in Leitch's system, because Leitch places no limit on the size of R and Q, and because 8-bit data units are a standard convenient size.

Leitch does not refer to the parity row as a "CRC". Ramabadran discloses that vertical parity (LRCC) is, in mathematical terms, a CRC, as it has a generator polynomial (x^n+1), where "n" is the length of each row. Accordingly, Q bits of Leitch's vertical parity row are a CRC with a generator polynomial (x^Q+1), and Leitch's vertical parity bit in the horizontal parity column is the "parity of the CRC". Leitch's vertical parity bit in the horizontal parity column (the Q+1-th bit in row R+1) is also, by definition, the parity bit of the R data row parities. Thus, in re-generating a vertical parity check bit on the horizontal parity bits in Leitch's system, Leitch's system would be "generating the parity of the parity bits of the plurality of bytes of data, such generated parity being the parity of the CRC of such data".

In re-generating a vertical parity check bit on the horizontal parity bits in Leitch's system with Q=8, Leitch's system would be "generating parity of the parity bits of the plurality of bytes". In comparing the received vertical parity check bit on the horizontal

parity bits in Leitch's system to the re-generated vertical parity check bit on the horizontal parity bits in Leitch's system, Leitch's system with Q=8 would be "comparing such generated parity with the parity bit of the CRC of the data".

Allowable Subject Matter

3. Claims 6 and 7 are allowed.

Response to Arguments

4. Applicant's arguments filed 03 November 2004 have been fully considered but they are not persuasive.

Applicant's arguments have been carefully reviewed and appear to contradict the examiner's understanding and explanations of parity calculation and checking, as well as CRC calculation and checking. The rejections have been clarified to show that the grounds thereof can been seen to have a sound and demonstrated basis in the algebra of linear and cyclic codes.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen M. Baker whose telephone number is (703) 305-9681. The examiner can normally be reached on Monday-Friday (11:00 AM - 7:30 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert DeCady can be reached on (703) 305-9595. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Stephen M. Baker
Primary Examiner
Art Unit 2133

smb